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REMARKS

Claims 1, 9, 15, 22, 27-32, and 33-36 are pending in the application. Claims 2-8, 10-14, 16-21, 23-26, and 37-51 have been withdrawn from consideration. Claims 1, 9, 15, 22, 27-32, and 33-36 are rejected. Specifically, claims 15, 22, and 33-36 are rejected under 35 U.S.C. 112, second paragraph. Claims 1, 9, 15, 22, 27-32, and 33-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yan in view of Tai.

Minor grammatical and typographical errors were fixed in the specification.

Claims 15, 33, and 35 have been modified to replace "fifth collimating means" with "input beam collimating means". This modification removes any confusion that might have developed with the introduction of a fifth collimating means, prior to a first through fourth. The applicant believes that these modifications remove the grounds for the 35 U.S.C. 112 rejections.

With respect to claims 1, 9, 15, 22, 27-32, and 33-36, although the Office Action finds some, but not all of the claimed elements in Yan and Tai, the applicant asserts that these elements are not arranged in the manner specified in the claims. Neither Yan nor Tai provide any suggestion that the elements should be arranged as specified in the claims and therefore the claims should be patentable over the combination of Yan and Tai.

Specifically, claim 1 recites that an extraordinary beam and an ordinary beam of the same wavelength λ_1 are to be combined by the polarization beam combiner. Similarly another extraordinary beam and another ordinary beam each having the same wavelength λ_2 are to be combined by the polarization beam combiner. The combined light beams are multiplexed by a filter.

The Office Action references column 3, lines 40-45 of Yan to assert that Yan teaches that ordinary and extraordinary modes be provided. The applicant does not believe that the discussion by Yan is pertinent to the claimed invention. Starting on line 38, Yan states, "In addition, the two prisms may be dispersive to avoid problem with polarization dependence. Likewise, one prism may be designed to separate TE and TM polarized light, and the other prism may be designed to combine the TE and TM modes so that the result is polarization independent. Techniques for creating these polarization effects are known in the art." Note first that what Yan states as known in the art are techniques for using a prism to combine or split the TE and TM modes. However, because some techniques are known, it would not necessarily be obvious to use them in the present context. Next note that Yan specifies that one prism be designed to combine the modes and the other to separate the modes. The purpose is to make the result polarization independent. In the present invention, the combiner only combines the ordinary and extraordinary beams. This polarization division multiplexing is claimed as part of the invention. It is not problem to be avoided, as stated by Yan. Therefore Yan

does not teach nor suggest the combined wavelength division multiplexing and polarization division multiplexing as claimed in the present application.

Claim 9 depends from claim 1 and further specifies that the polarization beam combiner is chosen from a selection of various prisms, none of which are explicitly mentioned by Yan. In addition, patentability of claim 1 implies patentability of claim 9.

Claim 15 is drawn to a de-multiplexer. The same arguments asserted with respect to claim 1 can be applied to claim 15. Yan does not teach the combined wavelength division de-multiplexing and polarization division de-multiplexing as claimed here.

Claim 22, dependent upon claim 15 is similar to claim 9 in that it recites specific prisms that are not explicitly mentioned by Yan. Additionally, patentability of claim 15 implies patentability of claim 22.

Claim 27 specifies detailed structure associated with the polarizing prism and specifies specific operation of the filter. Note that the claim involves combining the ordinary and extraordinary beams in each half of the prism, rather than designing one prism for combining and one for separating the modes. In addition, the claim specifies, "a polarizing prism having a first half with a first external surface and a second external surface, and a second half with a third external surface opposing to said second external surface and a fourth external surface opposing to said first external surface, the centers of said second external surface and said third external surface defining an optical axis, said first half combining said first pair of input beams which are incident on said first external surface into a first combined light beam with wavelength λ_1 , said second half combining said second pair of input beams which are incident on said third external surface into a second combined light beam with wavelength λ_2 ." The geometry specified requires that the input beams of different wavelengths enter the polarizing prism from external surfaces that are not opposed to each other. This differs from the teachings of Yan, in which the mode of operation of the device substantially dictates that the input beams of different wavelengths enter the prisms on opposing external faces. Therefore the device of Yan could not be easily modified to satisfy the claim limitations. In addition, the claim specifies that the output beam be along the optical axis, another limitation that is not met by Yan.

Claim 28 depends upon 27 and specifies a fifth collimating means. Claim 29 depends upon claim 28 and further specifies subassemblies that hold optical fibers in defined relationships with the collimating means. In addition, the claim specifies that specific fibers be polarization-maintaining, a fiber property not discussed in Yan or Tai. Claim 30 depends from claim 28 and further specifies different types of collimating means. Claim 31 depends from claim 27 and specifies specific prisms, none of which are mentioned in Yan or Tai. Claim 32 depends from claim 27 and limits the filter to being either a device selected from either a grating or a thin film. Because claims 28-32 depend from claim 27, patentability of claim 27 implies patentability of these claims.

Claim 33 involves a de-multiplexer that specifically identifies a polarizing prism as the polarization beam splitter. Similarly to claim 27, this claim also specifies an optical axis along the centers of two opposing external surfaces of the prism. The input light beam is to be directed along the optical axis. Note that this is not what is taught by Yan. In Yan, column 3, lines 53-55 indicate that a mechanism 16 adjusts the angle of the incident beam. Therefore the mode of operation of Yan does not keep the input beam parallel to the optical axis as required in the claim limitations. Therefore, in addition to the arguments made previously, this limitation further distinguishes the claimed invention of the present application from the prior art.

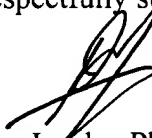
Claim 34, depends from claim 33 and further recites collimating means for receiving the various output beams. Claim 35, depends from claim 34 and further specifies subassemblies that hold optical fibers in defined relationships with the collimating means. Claim 36 depends from claim 35 and further specifies properties of the various fibers, in particular, that certain of the fibers be polarization-maintaining. This property of the fibers is not taught nor suggested by Yan or Tai. Because claims 34-36 depend upon claim 33, patentability of claim 33 implies patentability of these claims.

With allowance of claims 1 and 22, the applicant respectfully requests rejoinder of all unexamined claims dependent upon 1 and 22.

CONCLUSION

In view of the above comments, the applicant respectfully submits that this patent application is in condition for allowance. Early action to this end is requested.

Respectfully submitted,

A handwritten signature in black ink, appearing to be 'RJ' or similar initials, written over the printed name.

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